



**Scientific  
Drilling**

## Survey Certification

7327 West Barton Road  
Casper, WY 82604  
(307)-472-6621 Fax (307) 472-5439

<b>Operator</b>	<u>Carrizo Oil &amp; Gas</u>
<b>Well Name &amp; No.</b>	<u>Timbro Ranch 1-41-9-59 Pilot Hole</u>
<b>County &amp; State</b>	<u>Weld County, CO</u>
<b>SDI Job No.</b>	<u>41HMP1202154</u>
<b>Rig</b>	<u>Xtreme 19</u>
<b>Survey Date</b>	<u>4-Feb-2012</u>

I, Julie Cruse, having personal knowledge of all the facts, hereby  
certify that the attached directional survey run from a measured depth of 0 feet to a  
measured depth of 6930 feet is true and correct as determined from all available records.

Julie Cruse  
Signature

28-Feb-2012  
Date

**Julie Cruse**  
Rockies Region Engineer  
Scientific Drilling - Rocky Mountain District



## **Carrizo Oil & Gas**

**Weld County, CO (NAD83)**

**Timbro Ranch**

**Timbro Ranch 1-41-9-59**

**Pilot Hole**

**Design: Pilot Hole**

## **Standard Survey Report**

**28 February, 2012**



<b>Company:</b>	Carrizo Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Timbro Ranch 1-41-9-59
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	GL 4893.5' & KB 17' @ 4910.50ft (Xtreme 19)
<b>Site:</b>	Timbro Ranch	<b>MD Reference:</b>	GL 4893.5' & KB 17' @ 4910.50ft (Xtreme 19)
<b>Well:</b>	Timbro Ranch 1-41-9-59	<b>North Reference:</b>	True
<b>Wellbore:</b>	Pilot Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Pilot Hole	<b>Database:</b>	Rockies Compass Server

<b>Project</b>	Weld County, CO (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Timbro Ranch			
Site Position:		Northing:	1,533,377.38 usft	Latitude:	40° 47' 12.444 N
From:	Lat/Long	Easting:	3,437,830.84 usft	Longitude:	103° 55' 7.860 W
Position Uncertainty:	0.00 ft	Slot Radius:	13.200 in	Grid Convergence:	1.02 °

Well	Timbro Ranch 1-41-9-59, 261' FNL 423' FEL Sec 1 T9N R59W					
Well Position	+N/-S	0.00 ft	Northing:	1,533,377.37 usft	Latitude:	40° 47' 12.444 N
	+E/-W	0.00 ft	Easting:	3,437,830.84 usft	Longitude:	103° 55' 7.860 W
Position Uncertainty		0.00 ft	Wellhead Elevation:	ft	Ground Level:	4,893.50 ft

<b>Wellbore</b>	Pilot Hole				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2010	2012/01/31	8.35	67.48	53,354

<b>Design</b>	Pilot Hole				
<b>Audit Notes:</b>					
<b>Version:</b>	1.0	<b>Phase:</b>	ACTUAL	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	270.31	

<b>Survey Program</b>	<b>Date</b>	2012/02/28			
<b>From (ft)</b>	<b>To (ft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>	
1,437.00	6,930.00	Survey #1 (Pilot Hole)	SDI MWD	SDI MWD - Standard ver 1.0.1	

<b>Survey</b>									
<b>Measured Depth (ft)</b>	<b>Inclination (°)</b>	<b>Azimuth (°)</b>	<b>Vertical Depth (ft)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Vertical Section (ft)</b>	<b>Dogleg Rate (°/100ft)</b>	<b>Build Rate (°/100ft)</b>	<b>Turn Rate (°/100ft)</b>
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1,437.00	0.00	0.00	1,437.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>First SDI MWD Survey</b>									
1,465.00	0.62	180.70	1,465.00	-0.15	0.00	0.00	2.21	2.21	0.00
1,557.00	1.23	241.26	1,556.99	-1.12	-0.87	0.87	1.16	0.66	65.83
1,649.00	2.11	261.12	1,648.95	-1.86	-3.41	3.40	1.13	0.96	21.59
1,741.00	2.11	263.93	1,740.89	-2.30	-6.77	6.76	0.11	0.00	3.05
1,825.00	2.99	278.61	1,824.80	-2.14	-10.47	10.46	1.30	1.05	17.48
1,910.00	2.99	266.83	1,909.69	-1.93	-14.88	14.87	0.72	0.00	-13.86
1,995.00	3.25	269.82	1,994.56	-2.06	-19.50	19.49	0.36	0.31	3.52
2,081.00	3.52	272.90	2,080.41	-1.93	-24.58	24.57	0.38	0.31	3.58



<b>Company:</b>	Carrizo Oil & Gas	<b>Local Co-ordinate Reference:</b>	Well Timbro Ranch 1-41-9-59
<b>Project:</b>	Weld County, CO (NAD83)	<b>TVD Reference:</b>	GL 4893.5' & KB 17' @ 4910.50ft (Xtreme 19)
<b>Site:</b>	Timbro Ranch	<b>MD Reference:</b>	GL 4893.5' & KB 17' @ 4910.50ft (Xtreme 19)
<b>Well:</b>	Timbro Ranch 1-41-9-59	<b>North Reference:</b>	True
<b>Wellbore:</b>	Pilot Hole	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Pilot Hole	<b>Database:</b>	Rockies Compass Server

Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
2,166.00	3.69	274.48	2,165.24	-1.59	-29.91	29.90	0.23	0.20	1.86
2,251.00	3.08	273.77	2,250.10	-1.22	-34.92	34.91	0.72	-0.72	-0.84
2,336.00	3.17	269.29	2,334.97	-1.10	-39.54	39.54	0.31	0.11	-5.27
2,422.00	3.17	266.04	2,420.84	-1.29	-44.29	44.29	0.21	0.00	-3.78
2,507.00	3.17	265.34	2,505.71	-1.65	-48.98	48.97	0.05	0.00	-0.82
2,592.00	3.25	267.80	2,590.58	-1.93	-53.73	53.72	0.19	0.09	2.89
2,680.00	3.17	267.97	2,678.44	-2.11	-58.66	58.64	0.09	-0.09	0.19
2,765.00	3.25	268.41	2,763.30	-2.26	-63.41	63.40	0.10	0.09	0.52
2,850.00	3.17	270.44	2,848.17	-2.31	-68.17	68.16	0.16	-0.09	2.39
2,933.00	3.25	271.58	2,931.04	-2.23	-72.82	72.80	0.12	0.10	1.37
3,018.00	3.61	257.95	3,015.89	-2.72	-77.84	77.83	1.05	0.42	-16.04
3,103.00	3.69	266.22	3,100.72	-3.46	-83.19	83.17	0.63	0.09	9.73
3,187.00	4.22	266.83	3,184.52	-3.81	-88.97	88.95	0.63	0.63	0.73
3,272.00	3.78	268.50	3,269.31	-4.06	-94.90	94.87	0.54	-0.52	1.96
3,357.00	3.25	268.50	3,354.15	-4.19	-100.11	100.08	0.62	-0.62	0.00
3,442.00	3.78	266.92	3,438.99	-4.41	-105.31	105.29	0.63	0.62	-1.86
3,528.00	3.61	275.97	3,524.81	-4.28	-110.84	110.81	0.71	-0.20	10.52
3,613.00	3.87	278.78	3,609.63	-3.56	-116.33	116.31	0.37	0.31	3.31
3,698.00	3.78	275.97	3,694.44	-2.83	-121.95	121.94	0.24	-0.11	-3.31
3,783.00	3.43	258.48	3,779.28	-3.05	-127.23	127.21	1.35	-0.41	-20.58
3,867.00	3.69	255.85	3,863.11	-4.21	-132.32	132.29	0.37	0.31	-3.13
3,953.00	3.43	256.99	3,948.95	-5.47	-137.51	137.47	0.31	-0.30	1.33
4,038.00	2.99	274.83	4,033.82	-5.85	-142.19	142.16	1.28	-0.52	20.99
4,123.00	3.25	283.44	4,118.69	-5.11	-146.74	146.71	0.63	0.31	10.13
4,208.00	3.52	290.21	4,203.54	-3.64	-151.54	151.51	0.57	0.32	7.96
4,293.00	3.17	285.38	4,288.40	-2.12	-156.25	156.24	0.53	-0.41	-5.68
4,379.00	2.80	290.52	4,374.28	-0.75	-160.51	160.51	0.53	-0.43	5.98
4,463.00	2.64	278.61	4,458.19	0.26	-164.35	164.34	0.70	-0.19	-14.18
4,549.00	2.37	288.36	4,544.10	1.11	-167.99	168.00	0.59	-0.31	11.34
4,634.00	2.55	264.99	4,629.03	1.50	-171.54	171.55	1.19	0.21	-27.49
4,719.00	2.37	273.95	4,713.95	1.46	-175.18	175.19	0.50	-0.21	10.54
4,803.00	2.99	275.80	4,797.86	1.80	-179.09	179.10	0.75	0.74	2.20
4,888.00	2.81	278.61	4,882.75	2.33	-183.36	183.37	0.27	-0.21	3.31
4,974.00	2.99	264.11	4,968.64	2.42	-187.67	187.68	0.88	0.21	-16.86
5,058.00	2.64	266.83	5,052.54	2.09	-191.78	191.79	0.45	-0.42	3.24
5,143.00	2.20	269.73	5,137.46	1.97	-195.37	195.38	0.54	-0.52	3.41
5,228.00	2.90	261.82	5,222.38	1.66	-199.13	199.14	0.92	0.82	-9.31
5,315.00	2.37	262.44	5,309.29	1.11	-203.09	203.10	0.61	-0.61	0.71
5,399.00	1.67	266.92	5,393.23	0.81	-206.04	206.04	0.85	-0.83	5.33
5,484.00	1.23	264.63	5,478.21	0.66	-208.18	208.18	0.52	-0.52	-2.69
5,569.00	1.06	261.65	5,563.19	0.46	-209.87	209.87	0.21	-0.20	-3.51
5,653.00	1.14	259.80	5,647.17	0.20	-211.46	211.46	0.10	0.10	-2.20
5,738.00	0.88	248.29	5,732.16	-0.19	-212.90	212.89	0.39	-0.31	-13.54

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<b>Design:</b>	Pilot Hole	<b>Database:</b>	Rockies Compass Server

Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	
5,822.00	0.62	253.56	5,816.15	-0.56	-213.93	213.93	0.32	-0.31	6.27	
5,908.00	0.53	248.99	5,902.15	-0.83	-214.75	214.74	0.12	-0.10	-5.31	
5,993.00	0.26	237.12	5,987.15	-1.08	-215.28	215.27	0.33	-0.32	-13.96	
6,078.00	0.35	266.74	6,072.15	-1.20	-215.70	215.69	0.21	0.11	34.85	
6,163.00	0.09	226.49	6,157.14	-1.26	-216.01	216.00	0.34	-0.31	-47.35	
6,248.00	0.18	294.96	6,242.14	-1.25	-216.18	216.17	0.20	0.11	80.55	
6,333.00	0.09	287.22	6,327.14	-1.17	-216.36	216.35	0.11	-0.11	-9.11	
6,417.00	0.26	9.14	6,411.14	-0.96	-216.39	216.39	0.31	0.20	97.52	
6,503.00	0.26	63.54	6,497.14	-0.68	-216.19	216.18	0.28	0.00	63.26	
6,587.00	0.26	92.81	6,581.14	-0.61	-215.83	215.82	0.16	0.00	34.85	
6,672.00	0.26	106.99	6,666.14	-0.67	-215.45	215.44	0.08	0.00	16.68	
6,757.00	0.26	145.28	6,751.14	-0.89	-215.16	215.15	0.20	0.00	45.05	
6,842.00	0.35	126.65	6,836.14	-1.20	-214.84	214.83	0.16	0.11	-21.92	
6,875.00	0.35	117.86	6,869.14	-1.31	-214.67	214.66	0.16	0.00	-26.64	
Last SDI MWD Survey										
6,930.00	0.35	117.86	6,924.14	-1.47	-214.37	214.36	0.00	0.00	0.00	
Projection to TD										

Design Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates			
		+N/-S (ft)	+E/-W (ft)	Comment	
1,437.00	1,437.00	0.00	0.00	First SDI MWD Survey	
6,875.00	6,869.14	-1.31	-214.67	Last SDI MWD Survey	
6,930.00	6,924.14	-1.47	-214.37	Projection to TD	

Checked By: _____	Approved By: _____	Date: _____
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